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10/674,234	09/29/2003	Nick M. Mitchell	YOR920030485	1886

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EXAMINER
PADMANABHAN, KAVITA

ART UNIT	PAPER NUMBER
2161	

NOTIFICATION DATE	DELIVERY MODE
02/04/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>09 November 2007</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1 and 3-13</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1 and 3-13</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>27 October 2006</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Status of Claims

1. Claims 1 and 3-13 are pending.

2. Claims 1, 12, and 13 have been amended.

3. Claims 1 and 3-13 are rejected.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. **Claims 1 and 3-13** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With respect to **claim 1**, there does not appear to be support for the newly amended limitation, "periodically traversing *only* selected *constant-sized* subgraphs *of a full graph* in the region in the application in order to detect data structure changes *of patterns* in the subgraphs while the application is running". The applicant also has not pointed to portions of the specification that might contain the necessary support. **Claims 12 and 13** recite similar limitations and are therefore similarly rejected. **Claims 3-11** are rejected in view of their dependence on claim 1.

6.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7.   **Claims 1 and 3-13** are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

     Claim 1 recites, "*constant-sized subgraphs* ... to detect data structure *changes* of patterns

in the subgraphs". It is unclear how a constant-sized subgraph could also be a changing

subgraph. **Claims 12 and 13** recite similar limitations and are therefore similarly rejected.

Claims 3-11 are rejected in view of their dependence on claim 1.

Claim Rejections - 35 USC § 102

8.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9.   **Claims 1 and 3-13** are rejected under 35 U.S.C. 102(b) as being anticipated by **Bournas**

et al. (US 6,061,679, hereinafter "Bournas").

     In regards to **claim 1, Bournas** teaches a method of determining how a region of a data

structure in an application evolves, comprising:

   –   periodically traversing only selected constant-sized subgraphs of a full graph in the

       region in the application in order to detect data structure changes of patterns in the

subgraphs while the application is running **(Bournas, col. 4, lines 45-47, 61-65, col. 6, lines 9-10, col. 7, line 66 – col. 8, line 6, col. 8, lines 39-66 – searching the data structure to determine the placement of the new key mask whenever an add request is made constitutes traversing subgraphs of a data structure periodically; Bournas, col. 8, lines 39-66 – searching the data structure to locate where to place the new key mask constitutes detecting structural changes of patterns to the subgraphs, in that wherever the key mask is to be added is located and a change is made to that particular subgraph)**, wherein a data structure is a subgraph of an object reference graph snapshot and the subgraph comprises nodes that own constituents **(Bournas; Figs. 2 and 3a –nodes of subgraph have constituents, i.e. keys)**;

–   using these data structure changes to describe, characterize, and identify changes to the region as a whole **(Bournas, col. 7, line 66 – col. 8, line 6 – the depicted changes to the subgraphs, for example an addition, describe, characterize, and identify changes in the data structure)** and

–   reporting the changes to the region to an analysis agent **(Bournas, col. 9, lines 12-13, Fig. 4b, step 430)**.

In regards to **claim 3, Bournas** teaches the method of claim 1 used to detect one of the following changes to a region: additions to a region; removals from a region; and internal restructuring within a region **(Bournas, col. 8, lines 5-6)**.

In regards to **claim 4, Bournas** teaches the method of claim 1 wherein the selected subgraphs
to traverse are derived by

- computing the region key for the constituents of the data structure **(Bournas, col. 8, lines
  39-66)**; and

- identifying the unique set of paths from owner proxy to change proxy as the set of
  traversals **(Bournas, col. 8, lines 39-66)**.

In regards to **claim 5, Bournas** teaches the method of claim 4 wherein the traversals are
shortened by

- identifying a subpath of the path which is unlikely to change as the region evolves
  **(Bournas, col. 8, lines 39-66 – if receive a request to add a key mask, which would be
  located at a particular subpath, the other subpaths are therefor unlikely to change,
  since they are not the target of the change)**; and

- trimming the path to exclude the parts of the path which are unlikely to change **(Bournas,
  col. 8, lines 39-66 – since the subpath leading to where the change is made is
  traversed, the other subpaths are logically trimmed/excluded)**.

In regards to **claim 6, Bournas** teaches the method of claim 1 wherein determining how a
region of a data structure in the application evolves is a continuous and adaptive process
(Bournas, col. 4, lines 45-47, col. 7, line 67 – col. 8, line 2).

In regards to **claim 7**, **Bournas** teaches the method of claim 6 wherein the process is made continuous and adaptive by

- identifying a set of desired updates **(Bournas, col. 8, lines 5-6)**; and

- adjusting the period in between traversals based on whether the desired updates have been witnessed **(Bournas, col. 7, line 66 – col. 8, line 6 – the traversals occur when a change is made)**.

In regards to **claim 8**, **Bournas** teaches the method of claim 6 wherein the process is made continuous and adaptive by

- identifying a set of desired updates **(Bournas, col. 8, lines 5-6)**; and

- adjusting the frequency of sampling any one traversal based on whether that traversal has detected desired updates **(Bournas, col. 7, line 66 – col. 8, line 6, col. 8, lines 39-66)**.

In regards to **claim 9**, **Bournas** teaches the method of claim 6 wherein the process is made continuous and adaptive by implementing one of the following procedures based on the result of performing a traversal: adding new traversals; removing existing traversals; and modifying the path of existing traversals **(Bournas, col. 8, lines 39-66)**.

In regards to **claim 10**, **Bournas** teaches the method of claim 1 further comprising updating qualitative characterizations of the regions under analysis based on structural changes to the regions as a whole **(Bournas, col. 8, lines 39-66, col. 9, lines 40-45 – updating the subgraphs based on the data structure constitutes updating qualitative characterizations)**.

In regards to **claim 11**, **Bournas** teaches the method of claim 1 further comprising updating quantitative characterizations of the regions under analysis based on structural changes to the regions as a whole (**Bournas, col. 8, lines 39-66, col. 9, lines 40-45 – updating the subgraphs based on the data structure constitutes updating quantitative characterizations as depicted by numbers of subgraphs, keymasks, etc, which are quantitative measures**).

Claims 12 and 13 are rejected with the same rationale given for claim 1.

Response to Arguments

10.   Applicant's arguments filed 11/9/07 with respect to the prior art applied to the claims have been fully considered but they are not persuasive.

The applicant argues at page 6 of applicant's remarks that Bournas does not teach traversing selected constant-sized subgraphs, as amended. The examiner respectfully disagrees. The examiner first notes that there does not appear to be support for this amendment in the applicant's original specification, as explained in the 35 USC 112 section above. That being said, the examiner asserts that Bournas does indeed teach traversing selected constant-sized subgraphs, in that each tree is associated with a specific constant key mask range (Bournas; col. 6, lines 9-10).

Applicant then goes on to seemingly admit at page 6 of applicant's remarks that Bournas does indeed detect structural changes by periodically performing a lookup to see if the desired item is there or not, and that a lookup involves a search in the data structure for the desired key.

Applicant argues that claim 1 requires a scan of only the constant-sized subgraphs of the full

graph that is necessary to detect changes of interest. As stated above, the examiner asserts that

Bournas' subgraphs are indeed constant-sized in that they represent a fixed range, and that these

subgraphs are scanned, in accordance with the claim.

The applicant at page 7 of applicant's remarks that Bournas requires that "each

addressable element [...include] its own address" and therefore cannot detect changes of

patterns. The examiner respectfully disagrees and asserts that Bournas does indeed detect

changes in patterns (Bournas, col. 8, lines 39-66). Applicant even admits at page 6 of applicant's

remarks that Bournas searches the data structure to detect structural changes. The examiner

asserts that undoubtedly a change to a data structure or a tree constitutes a pattern change. The

specific examples cited by the applicant at page 7 of applicant's remarks are not reflected in the

language of the claim.

Conclusion

11.   Applicant's amendment necessitated the new ground(s) of rejection presented in this

Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this

final action.

12.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to **Kavita Padmanabhan** whose telephone number is **571-272-**

8352. The examiner can normally be reached on Monday-Friday, 9:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Apu Mofiz can be reached on 571-272-4080. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kavita Padmanabhan   January 22, 2008
Assistant Examiner
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MOHAMMAD ALI
SUPERVISORY PATENT EXAMINER